

**PROTOCOL
FOR THE UTILIZATION OF WASTE FRUITS
ON AGRICULTURAL LANDS**

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Ministry of Environment & Energy



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1.0 INTRODUCTION

This protocol describes the criteria governing the use of waste fruits as soil conditioning agents on agricultural lands. The criteria recommended in the protocol represent good management practice and have been developed by staff of the Ontario Ministries, Agriculture, Food and Rural Affairs, and Environment and Energy in consultation with representatives of the agricultural community. These recommendations apply only to the spreading of solid waste fruits which have not been altered by chemical or thermal processing and for which the consent of the land owner has been obtained.

For information on the use of other waste materials for soil conditioning, reference should be made to the two Provincial guidelines entitled Guidelines for Sewage Sludge Utilization on Agricultural Lands and Interim Guidelines for the Utilization of Waste (Other Than Sewage Sludge) on Agricultural Lands.

2.0 PROCEDURAL REQUIREMENTS

It is recommended that the criteria described in this protocol be used where waste fruits are to be utilized as soil conditioning agents on agricultural lands. In situations where approval is required for this activity under the Ministry of Environment and Energy's organic soil conditioning site program, these criteria will serve as a basis for the issuance of those approvals.

Under the Ministry's organic soil conditioning site program, waste which meets the processed organic waste definition pursuant to Regulation 347 of the Environmental Protection Act may be applied to land as a soil conditioner. Waste fruits, which have not been altered by chemical or thermal processing would normally meet this definition. Application forms for approval under the organic soil conditioning site program are available from any local office of the Ministry of Environment and Energy.

Approval under the organic soil conditioning site program is not required for the application of waste fruits to agricultural lands where the waste fruits result from farm operations. As

packing and processing operations are considered to be integral parts of normal farming activities, the agricultural waste exemption also applies to waste fruits from these operations where the fruits are to be used as soil conditioning agents on agricultural lands. This exemption applies to packing and processing operations which receive fruits from a farm and provided the waste fruits have not been altered by chemical or thermal processing. It does not apply to waste fruits from other generators such as food terminals and retail food stores.

3.0 QUALITY OF WASTE FRUITS

This protocol applies only to the spreading of solid waste fruits which have not been altered by chemical or thermal processing. If managed properly, these materials have an acceptably low odour potential and an acceptably low concentration of pathogenic organisms for application to agricultural land. Fruit culls and fruits which have been physically processed such as by washing, brushing, crushing and cutting are acceptable. The heating of grapes to sub-pasteurization temperatures during wine making is also acceptable as it does not significantly alter the waste for purposes of land application. The waste fruits should be essentially free of any deleterious materials such as packaging material, plastic or wire.

4.0. APPLICATION RATES

The maximum application rates for waste fruits should be based on an assessment of the following:

- the nitrogen content of the waste fruit, and
- the nitrogen demand of the agricultural crop.

The criteria for nitrogen content and nitrogen demand provided in Tables I and II should be used in determining maximum application rates unless more specific recommendations are obtained from an agronomist. Similar determinations should be made for other types of crops not listed in Table II. Table I shows how to perform this calculation.

In some cases, the maximum application rate may also be limited by the practicality of incorporating the waste fruits into the soil, the desired amount to be left as soil cover and consideration of any potential environmental impact. The determination of maximum application rates should consider these factors.

As the primary purpose of applying waste fruits to agricultural land is their value as a soil conditioning agent, there should be no case where the annual application rate exceeds 150 tonnes per hectare. An application rate in excess of this amount is indicative of a disposal operation rather than use for soil conditioning purposes.

The application rate determined by the calculation shown in Table I is based on an annual application of waste fruits. The calculation does not take into account situations where other waste materials such as sewage sludge may have been spread. In determining the application rate for waste fruits, therefore, the effects of any other recent waste spreading activities should also be considered.

Under certain situations, the application of waste fruits to land may alter soil pH sufficiently to adversely affect growing conditions. This is most likely to occur following repeated applications of low pH wastes to a given parcel of land. In addition, where the waste fruits are to be applied to fruit producing land, consideration should be given to ensuring pest and disease potential is not increased. The local office of the Ministry of Agriculture, Food and Rural Affairs can be contacted for further information on these issues.

From an agricultural perspective, it is recommended that soil testing be conducted from time to time. Soil testing can provide information on general soil characteristics and the amount of plant available nutrients present in the soil. The use of this information to assist in the determination of application rates is consistent with agricultural best management practices. A list of accredited soil test facilities is available from the local office of the Ministry of Agriculture, Food and Rural Affairs.

The local office of the Ministry of Agriculture, Food and Rural Affairs may be contacted for further information on determining application rates and potential pH or pest/disease considerations.

5.0 SEPARATION DISTANCES FOR SPREADING

Recommended separation distances for spreading waste fruits are listed below. Provided the waste fruits meet the quality requirements described in this protocol, the presence of field drainage tiles should not affect the recommended separation

distances. Winter spreading of waste fruits is also acceptable provided they are incorporated into the soil as soon as field and weather conditions permit. Conditions should permit waste fruits which have been winter spread to be incorporated into soil by no later than May 31 of each year.

The minimum separation distances for spreading waste fruits are as follows:

- 15 meters (50 feet) from dug or drilled wells
- 90 meters (300 feet) from individual residences
- 450 meters (1500 feet) from a residential area (ie. a group of five or more residences)
- 45 meters (150 feet) from a surface water body including streams, ponds, lakes and inlets to field tiles; this separation distance may be reduced to a minimum of 10 meters (35 feet) if the waste fruits are incorporated into the soil within 24 hours of spreading

The separation distances listed above for individual residences and residential areas have been determined based on the spreading of waste fruits with a greater potential for odour. Where the waste fruit to be spread has a significantly reduced odour potential, these separation distances may be reduced to a minimum of 45 meters (150 feet) for individual residences and 150 meters (500 feet) for a residential area.

6.0 STORAGE

Provided the quality requirements for the waste fruits are maintained, storage at the receiving farm is acceptable. For waste fruits which could break down quickly, storage should be in a contained area. For winter storage, waste fruits should be removed from storage and incorporated into the soil as soon as field conditions permit, which should be no later than May 31 of each year. For late summer or fall storage, waste fruits should be incorporated into the soil as soon as possible to minimize the potential for odours and disease or pest problems. The local office of the Ministry of Agriculture, Food and Rural Affairs should be consulted for information on disease or pest control involving storage.

The separation distances for the storage of waste fruits, at a location other than where the waste is produced are as follows:

- 45 meters (150 feet) from dug or drilled wells
 - 150 meters (500 feet) from individual residences
 - 450 meters (1500 feet) from a residential area (ie. a group of five or more residences)
 - 90 meters (300 feet) from a surface water body including streams, ponds, lakes and inlets to field tiles
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For more information:

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Waste Vegetables Protocol also available.

TABLE I

TOTAL NITROGEN CONTENT OF RAW FRUITS

Fruits	Nitrogen Content ¹
Apple	0.3
Apple pomace (dried - 11% moisture)	7.1
Apple pomace (wet - 80% moisture)	1.9
Apricot	2.2
Blackberries	1.0
Blueberries	1.0
Cherry (sour)	1.2
Cherry (sweet)	2.1
Cranberry	0.6
Grape	1.1
Grape pomace (9% moisture)	12.5
Nectarine	1.2
Peach	1.1
Pear	0.6
Plum	1.3
Raspberry	1.2
Rhubarb	1.2

¹ Total N content of fruit (kg/tonne)

To calculate application rate:

$$\text{Rate}^2 \text{ (tonne/ha)} = \frac{\text{Total N required by crop (kg/ha)}}{\text{Total N content of fruit (kg/tonne)}}$$

² Application rate not to exceed 150 tonnes/ha

TABLE II

NITROGEN DEMAND OF AGRICULTURAL CROPS

Agricultural Crops	Nitrogen Demand ¹
<u>Field Crops</u>	
Oats, buckwheat, millet, spring rye (S. Ont.) ²	35
Oats, buckwheat, millet, spring rye (N. Ont.) ²	55
Barley	45
Mixed grain, flax, fodder rape, kale, (S. Ont.) ²	45
Mixed grain, flax, fodder rape, kale, (N. Ont.) ²	70
Spring wheat	70
Sunflower	90
Mustard	50
Winter wheat, winter barley	90
Winter triticale	80
Winter rye	90
Corn (in SW. Ont.) ³	170
Corn (in other counties) ³	100
Soybeans	0
Field beans, peas	10
Sweet corn	90
Sorghum	100
Winter canola (fall)	40
Winter canola (spring)	150
<u>Perennial Forages</u>	
Hay or pasture at seeding (without a nurse crop)	0
Hay or pasture at seeding (with a nurse crop)	15
Unimproved pasture	50
Grass for seed	90
Hay or pasture (1/2 or more legume)	0
Hay or pasture (1/3 to 1/2 legume)	60

¹ Total N required by crop (kg/ha)

² N. Ont. refers to Algoma, Cochrane, Kenora, Manitoulin, Nipissing, Rainy River, Sudbury, Temiskaming and Thunder Bay districts. S. Ont. refers to those parts of the province other than N. Ont. (and includes those counties listed as SW. Ont.).

³ SW. Ont. refers to Counties of Essex, Kent, Lambton, Middlesex, Elgin, Norfolk, Haldimand, Niagara, Brant and Wentworth



